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Published in:
Abstracts

Publication date:
2011

Document Version
Publisher's PDF, also known as Version of record

P-39 Metallic and insulating interfaces of amorphous $SrTiO_3$-based oxide heterostructures

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The conductance confined at the interface of complex oxide heterostructures provides new opportunities to explore nanoelectronic as well as nanoionic devices. Herein we show that metallic interfaces can be realized in $SrTiO_3$-based heterostructures with various insulating overlayers of amorphous $LaAlO_3$, $SrTiO_3$ and yttria-stabilized zirconia films. On the other hand, samples of amorphous $La_{7/8}Sr_{1/8}MnO_3$ films on $SrTiO_3$ substrates remain insulating. The interfacial conductivity results from the formation of oxygen vacancies near the interface, suggesting that the redox reactions on the surface of $SrTiO_3$ substrates play an important role.

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